

Alan Lacer

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River Falls, Wisconsin
715-426-9451
alan@alanlacer.com
www.alanlacer.com

Alan has been involved in the turning field for more than 35 years as a turner, teacher, writer, exhibition coordinator, demonstrator, expert witness, and past president of the AAW. His work has appeared in several regional and national shows exhibitions. He has been a regular instructor and demonstrator of the craft, having worked in all 50 states and 5 foreign countries.

His writings (more than 140 published) have covered technical aspects of woodturning, many specific projects, stories related to the history of woodturning, and the turning traditions of Japan and Germany. He also has produced five videos on his own, with two of them winning a total of four



national awards. In 1999, the AAW awarded him its Lifetime Honorary Member Award for his contributions to the field.



Sharpening Guidelines

EQUIPMENT

Wheel grinder (I prefer 1725 or 1800 rpm) set just below chest height, 8" diameter wheels 1" wide, 60- and 46-grit friable aluminum oxide wheels (usually white, pink, or blue) OR a SG wheel in J or K hardness, rock solid tool rests, eye protection, dust mask, wheel dresser (star-wheel, dressing stick, or diamond dresser ... all work but leave different surfaces - my choice is the diamond), medium India slipstone or diamond slipstone (best for modern tools), OR flat stone in diamond plus a tapered cone type of hone.

GUIDELINES - SCRAPING TYPE TOOLS

(flat steel, ground on one bevel only, similar to the cabinetmaker's scraper in its edge - a burr)

1. As with any turning tool, shape or profile the tool first. Scrapers are the most readily shaped tools, ground into whatever shape is needed.
2. Aim for a bevel angle between 70° and 50° (or think of it as a relief angle of 20° to 40° off of 90°). Set the platform of the grinder to the desired angle.

3. Although normally the bevel is not rubbed on the wood, and we do not hone these tools like cutting tools, I still aim for a single-faceted tool.
4. Start at heel of bevel and lap or grind forward until sparks just begin to appear over the top of the tool.
5. The burr that is raised from grinding or raised with a burnisher is the cutting edge at least 95% of the time. On some woods where the burr is too aggressive, we remove the burr and scrape with a sharp edge.
6. Leave the heavy burr from grinding if the intention is to remove considerable material and quickly. If you are using the scraper as a finishing tool, remove the burr with a flat honing tool (face of the slipstone or flat diamond stone). Next raise or pull up a more delicate burr with a burnisher – anything harder than the steel. I use the rounded edge of the slip stone or a cabinetmaker's burnisher to raise the burr. This is accomplished by tilting the burnisher just a few degrees past 90 (towards the top of the tool) to fold the steel back and pull along the full length of the edge. The burr size also is determined by the amount of pressure you apply to raise the burr ... the more pressure, the heavier the burr. You can successfully raise a burr 4 to 6 times before the edge is too rounded and you must then return to the grinder.

SHARPNESS INDICATORS FOR SCRAPERS

Feel for the burr by running your finger off the edge, not along the edge. When working with a sharp scraper, it should produce small ribbons. If it produces sawdust, the tool is usually dull.

GUIDELINES - CUTTING TYPE TOOLS

(gouges, skew chisels, parting tools, and hook tools)
The objective is to produce a single facet with a slight hollow grind. Remember to grind the bevel and not the edge.

1. Profile or shape the tool first. Don't be too timid removing large amounts of material to reach desired shape. Check a book, video, or a turner for recommended shapes and angles.
2. Next, begin to match the desired bevel angle to the profile (to actually sharpen the profile). Start at the heel (back edge) of the bevel and gradually lap forward toward the edge.

3. Use light pressure, be slow and deliberate, and maintain a relaxed attitude and grip with elbows in and a controlled stance.
4. Leave the tool on the wheel, looking at your progress only occasionally. Use the spark trail as feedback to determine where you are grinding. Stop grinding when sparks evenly begin to come over the top of the tool edge. Further grinding will produce a different or jagged edge. When the full bevel is in contact with wheel, tool is sharpened.
5. Avoid heating the tool to such a temperature that you see temper colors developing (yellows, purples, blues). When grinding carbon steel tools, quench in water quite regularly. If using high-speed tools, avoid quenching when tool becomes hot. Grind in stages, allowing the tool to air cool between sessions.

SHARPNESS INDICATORS

Under a strong light, if you can see the edge on cutting tools (skews, gouges, parting tools, etc.), there is no edge! The amount of effort or pressure it takes to remove material is a great indicator of sharpness. A sharp tool seems to allow the wood to cut itself, and a dull tool requires extra force. Look at the material coming off the tool. Dull tools tend to produce dust or short chips. Sharp tools tend to produce ribbons and curls, even if short. Listen for sharpness. Sharp tools make a hissing sound (much like a sharp plane). Dull tools sound flat or make a scraping sound.

HONING

(for skews, gouges, parting tools)

It is easier to keep a sharp tool sharp than it is to use a tool so long that you must return to the grinder. Get in the habit of regular honing, especially before final cuts. For gouges, hone the outside ground bevel first by touching the heel of the bevel, then gently rock into the area just below the edge, still touching the heel of bevel—always a 2-point contact. Next, hone the inside flute. Hold the curved edge of the slipstone perfectly flat within the flute and move the stone in and out of the flute until the entire edge has been honed. Hone both ground surfaces of the skew and parting tool in a similar 2-point strategy. You can hone only a properly ground tool. Grinding is still more critical than honing. Hone the bevel and not the edge!

Skew Chisels

I prefer rectangular sectioned skews, the heavier the better (at least 1/4" thick, better yet 5/16" or 3/8") with the short point side corners rounded back to the ferrule, the long point side corners chamfered (slight rounding) back to the ferrule. I do not like the oval sectioned skews – they are overly thinned

out, rock on the tool rest when grinding, nearly impossible to do the peeling cut (which I use a great deal), and present a changing angle to the wood as presented in several of the cuts below, such as the rolling cut.

SIZES

I work primarily with two sizes: a smaller one that is 1/2" or 5/8" and a larger one that is 1-1/4" or 1-3/8". These sizes work well on all the cuts below on stock 4" in diameter down to miniature sizes.

PREPARATION

Get it sharp through grinding, refine the edge through hand honing (I prefer a diamond hone), and (optional) using power honing on a MDF wheel charged with buffing compound that cuts high speed steel. Make sure the tool rest is filed flat and clean, perhaps waxing the top surface. Drive the work with a cup center rather than a spur, especially if you are in a learning phase.

PLANING

Most commonly done with the short point down and leading the cut, but cutting anywhere along the area just above the short point to just above center of tool. The handle is positioned at about 45° to the axis of lathe. Problems include skating, digging in, ribbing, chip-out.

ROUGHING

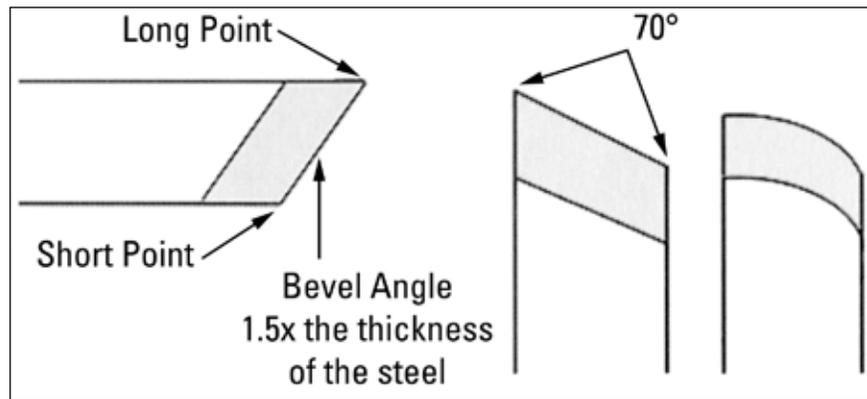
Using the tool in the same position as the planing cut, the skew can be used to round smaller diameters (usually under 2-1/2") and shorter pieces (generally under 18" in length). It is very much a pushing off of the corners to reach the cylinder. In chippy woods like red oak or ash, I either use the planing approach but shorten the length of each cut or use a peeling approach, followed by a planing cut to clean the surface.

PEELING

Using the skew like a veneer peeler's action on a log. The cutting edge is held parallel to the lathe's axis but with the handle low in back to provide a cutting edge that has bevel support, not a scraping action with just a sharp edge. Place the long point against the side of the wood you intend to keep. I normally use only a portion of the tool's edge because too heavy of a cut is hard to make or control. This is a sizing and rough cut, not for finishing. It can be used to take the corners off of a square, cut tenons, or remove large amounts of waste material.

VEE

Long point down, cutting with an arcing motion. For the first cut, the point is at a right angle to the axis of the lathe. To deepen or widen the vee that is created, come from the side of the original cut, being sure to clear the long cutting edge away from the area just cut. Problems include skating, burning, or stalling out.



SHOULDER OR FACING-OFF

Long point is down, and the long cutting edge is tilted away from the face of the shoulder only a few degrees (2 to 5). The cut is performed high on the work, using an arcing motion and ending above the center axis of the lathe. Problems include skating on entry or at any time on the face of the shoulder, digging in, stalling out, torn grain.

SAUCER

Done very much like the shoulder cut, except the action is now concave. Because this is cutting somewhat against the grain, don't take the cut too deeply into the end-grain. It is useful in doing the bottom of projects like a goblet, vase, toothpick holder, lidded box, etc., or for cutting rings free on a shaft.

PARTING

Done with the long point down, a series of vee cuts to part a small pieces off the headstock. Tends to avoid many of the problems of parting tools – cleaner cut on the end-grain and seldom snaps the piece off near the conclusion to create a small hole in the end of the project.

PUMMEL

The process of turning square elements that transition into round. I prefer to cut these with the long point down, especially square-shouldered pummels. Lay out the placement with a single 90° line (using a square or protractor). Cut to the waste side with a vee cut, then turn away material on the waste side until you reach a cylinder (using either a peeling or planing cut). Make the cut to the line using the same method as for a shoulder cut (for the square-shouldered pommel). For a curved pommel, make two 90° lines – one for the ending point (meets the rounded area of your project) and one for the starting point of the pommel. I usually create a square pommel at the end point. Then in a series of light cuts, add a curving motion to create the curved surface until you reach the line that marks the starting point of the pommel. If using a relatively friendly wood, I lead with the long point through the entirety of the cut. If using a difficult wood (usually very soft or easily torn on the end grain), I start with

the long point in the wood, then raise the handle with my back hand to allow cutting in the area just above the long point.

ROLLING

Using the skew to produce a convex shape, such as a bead. For small beads (under 3/8" wide or less), I often use the long point. For most beads and other convex shapes of a larger size, I make the cut with the short point down. You may cut with the short point in the wood (to assist with keeping the tool against the side of the bead and with a bevel rubbing) or with the area above the short point but not above the center of the tool's long cutting edge. Problems include skating (creating slashes in the bead), digging in (getting the trailing edge/point pulled into the wood), shapes that are not rounded but were intended to be convex.

COVING

Using the skew to produce a concave shape. Usually done with the short point down, moving the tool with a scooping action. Here the curved-edged skew certainly performs better. Problems include skating and failing to produce a curved surface in the cove.

ROUGH-GRAIN

Using the skew as the final tool to work an area of twisted grain, severe chip-out, or even a knot. First the area is lightly cut with a roughing gouge, with the cutting edge at a 90° angle to the lathe's axis and bevel support. Make the cuts across the difficult area lighter and lighter until almost dust-like in their action. Next, be sure the tool rest is almost touching the wood, the cutting edge of the skew is held parallel to the lathe's axis, the tool handle is horizontal, and the edge is presented in a scrapping approach with no bevel support. Make very light passes across the difficult area, completing with only the lightest of cuts.

END-GRAIN SCRAPE

Using the skew for scraping directly across end-grain as found on the rims or bases of projects such as lidded boxes, goblets, toothpick holders, etc. Get the tool extremely sharp by honing, place the tool rest as close to the work as possible, and present the tool facing the end-grain area. The tool handle should be horizontal (to present the edge in a scraping approach with no bevel support) to lightly scrape across the area. You should be getting tiny ribbons rising from the edge. If not, you may be tearing the grain.

Skew Warm-ups

SUGGESTED WOOD AND DIMENSIONS

Something soft and dry such as alder, poplar, or pine, approximately 1-3/4" square and 5" to 6" long.

BLOCK #1

- Remove corners from half the length using a planing method, the other half by peeling.
- Turn the block to an even cylinder using a planing cut.
- From the middle, taper the block down to a straight taper just slightly larger than the drive center. Do the same to the other half.
- Turn the block back into a small cylinder.
- Avoid hitting the drive centers (leave larger diameters at the ends). Turn as small a cylinder as possible.

BLOCK #2

- Turn a cylinder from the block.
- For a third of the length, create vee's that are below the diameter of the cylinder.
- For another third of the length, create vee's that are proud of the surface.
- For the remaining portion of the cylinder, create several individual micro beads, then a grouping of 3 or 4 micro beads.
- Face off both ends of the cylinder with shoulder cuts.

BLOCK #3

- Create a square-shouldered pommel on one end of the square and a rounded-shouldered pommel on the other end.
- Peel into the middle to create space for two more pommels. Do a rounded pommel on the left side and a lamb's tongue/ogee shouldered pommel on the other.

BLOCK #4

Turn the block into a cylinder. Starting at the left, lay out three beads approximately 1" wide, then three 7/8" wide, then three 3/4" wide, then three 1/2" wide.

BLOCK #5

- Turn the block to a cylinder. In the middle, turn a 3/8" wide bead that is proud of the cylinder. Using saucer cuts, cut the bead free of the cylinder.
- Using a coving cut, trap the bead within a deep cove.
- On the side near the headstock, about 1/2" from the end, make a series of vee cuts. Round over the end of the remaining stock that is close to the vee cut. With a series of vee cuts, part off the stock leaving a nice rounded end.

BLOCK #6

Find a blank with one or more large, solid knots. Plane the square into a rounded shape, being careful around the knots. Try to cut the knots as cleaning

as possible by using a planing method. Vary the angle of presentation and a very slow feed rate. Complete by light scraping across the knot.

Hook Tools

RESOURCES

- Drill rod of "O 1" tool steel, 3/8" diameter, 9" length, handle
- Pint to quart of olive oil in a metal can with lid
- Heat source: forge, MAPP gas, acetylene, propane with oxygen, etc.
- Tempilstik (optional) in 450°
- Mill file, sandpaper, soap, water
- Needle-nose pliers
- Abrasive disc (Norzon 60 grit) on MDF wheel, wheel grinder, slipstone

KEY TERMS

- Annealed. In a softened state.
- Hardened. Steel that has been heated to its critical temperature to bring to a very hard and brittle state.
- Tempering. The process of bringing hardened steel to a softer, working hardness for a particular use.
- Oxidation color spectrum. The color spectrum that results from the oxidation of cold steel as it slowly gets hot. First appearing is light yellow, medium to dark yellow, bronze, purple, then blues (dark to light), then back to silver.

PROCESS

1. Grind steel to shapes in diagrams above (don't get the edge sharp at this time).
2. Heat last 1" or so to bright red and bend with needle-nose pliers to create the hook, bending

to left as viewed from above (cutting edge down). A flute that is about 1/4" across is about right. Just be sure you can get inside the flute to hone.

3. Reheat hook area to bright cherry red (around 1450° - 1500°). Take your time and get a very even bright red consistently through the hook area, maintaining this look for several minutes. Quench quickly into the oil and stir rapidly for at least 30 seconds.
4. Test for hardness by trying to file top of hook. It should skate off.
5. Clean the hook and rest of rod back about 3". The goal is to get it as clean and polished as possible (use soap and water, wet/dry paper, polishing wheel).
6. Temper. Heat about 3" behind hook very gradually. Avoid bringing it to any shade of red, and let the oxidation colors develop. When the hook looks to be a medium to dark yellow color, quickly quench in water. Use the Tempilstik as an alternative.
7. Sharpen the outside bevel to achieve a cutting edge. Cool in water regularly to avoid bluing the edge. Hone the freshly ground bevel with a slipstone, followed by honing the inside flute of the hook. A 10° to 15° bevel angle that is positive (away from the cutting edge when edge is help upright) is a nice compromise between extremes.

